

### **IN THE CLAIMS**

Please amend the claims as follows:

Claims 1-13 (Cancelled).

14. (New) A device for culturing cells of diverse types, wherein a culture is prepared from cells of at least one specific type in a defined environment, and wherein the cells of the relevant culture are supplied with assigned, liquid nutrient media, growth factors, and gases, wherein the device comprises:

at least one cell culture chamber;

cell culturing and incubating unit to establish cells in at least one cell culture chamber of the device to adapt themselves to their living and growth conditions required in each individual case;

a video-assisted microscopic observation system to observe the at least one cell culture in the at least one cell culture chamber, wherein the video-assisted microscopic observation system comprises a camera, a microscope attachment connected to the camera, and a displaceable table on which the camera is installed, wherein the observation system includes control software on which approach positions are stored.

15. (New) The device according to claim 14, wherein observation system is to recognize stoed contours and the culture and arrangement of the cells when the camera next approaches.

16. (New) The device according to claim 14 , comprising:

a liquid media flow unit to start a flow of freely selectable, defined, liquid media into the at least one cell culture chamber so as to provide a continuous supply to the cells established in the at least one cell culture chamber;

a gas flow unit to start a flow of different gases with freely selectable concentrations into the at least one cell culture chamber so as to provide constant, continuous gassing of the cells established in the at least one cell culture chamber;

a heater to heat the at least one cell culture chamber in a regulated or controlled manner so that a constant temperature is ensured therein over the duration of an experiment;

a measurer to measure all the relevant cell culture parameters by sensors integrated in the at least one cell culture chamber, and

feedback control assigned to the at least one cell culture chamber so as to control incubation conditions in the cell culture chamber.

17. (New) The device according to claim 14, wherein at least one cell culture chamber comprises a predefined number of cell culture chambers which are connected in series.

18. (New) The device according to claim 14, wherein at least one cell culture chamber comprises a predefined number of cell culture chambers which are connected in parallel.

19. (New) The device according to claim 15, comprising a control to perform at least one of varying the type of liquid media, the flow directions thereof, the distribution thereof, and the flow rate thereof over the duration of an experiment.

20. (New) The device according to claim 15, comprising a control to perform at least one of varying the type of gases, the flow directions thereof, the distribution thereof and the gassing concentrations over the duration of an experiment.

21. (New) The device according to claim 14, comprising a temperature measurer to permanently measure temperature prevailing in the at least one cell culture within the at least one cell culture chamber and to input measured temperature as an actual temperature value into a suitable temperature control circuit, so that heating of the cell culture chamber can be suitably controlled.

22. (New) The device according to claim 14, wherein the at least one cell culture chamber includes a gas-permeable membrane so that a respective cell culture of a different type can be established on both sides of the membrane for the purpose of a direct co-culturing of the two cell

cultures, wherein a control is to control a first media flow to one side of the membrane for a first cell culture and to control a second media flow different from the first media flow to a second side of the membrane.

23. (New) The device according to claim 15, comprising a computer-controlled monitoring and control system to receive data obtained by at least one of

permanent microscopic observation of the at least one cell culture within the at least one cell culture chamber,

permanent measuring of the relevant cell culture parameters, and

permanent measuring of the temperature prevailing in the at least one cell culture within the at least one cell culture chamber, and

wherein a computer-controlled monitoring and control system is to process data and to transmit data for corresponding actuation of the feedback control.

24. (New) The device according to claim 15, comprising a software-assisted measuring system to measure the relevant cell culture parameters.

25. (New) The device according to claim 14, wherein the at least one cell culture chamber includes a plurality of chambers that are combined to form a closed cell chamber group which is arranged on a base which forms a heating system for the incubation.

26. (New) The device according to claim 14, wherein the at least one cell culture chamber includes a plurality of series connected chambers provide indirect co-culturing, wherein different biological systems in suitable cell culture chambers.

27. (New) The device according to claim 15 , comprising:

a liquid media flow unit to start a flow of freely selectable, defined, liquid media into the at least one cell culture chamber so as to provide a continuous supply to the cells established in the at least one cell culture chamber;

a gas flow unit to start a flow of different gases with freely selectable concentrations into the at least one cell culture chamber so as to provide constant, continuous gassing of the cells established in the at least one cell culture chamber;

a heater to heat the at least one cell culture chamber in a regulated or controlled manner so that a constant temperature is ensured therein over the duration of an experiment;

a measurer to measure all the relevant cell culture parameters by sensors integrated in the at least one cell culture chamber, and

feedback control assigned to the at least one cell culture chamber so as to control incubation conditions in the cell culture chamber.

28. (New) The device according to claim 27, wherein at least one cell culture chamber comprises a predefined number of cell culture chambers which are connected in series.

29. (New) The device according to claim 27, wherein at least one cell culture chamber comprises a predefined number of cell culture chambers which are connected in parallel.

30. (New) The device according to claim 27, comprising a control to perform at least one of varying the type of liquid media, the flow directions thereof, the distribution thereof, and the flow rate thereof over the duration of an experiment.

31. (New) The device according to claim 30, comprising a control to perform at least one of varying the type of gases, the flow directions thereof, the distribution thereof and the gassing concentrations over the duration of an experiment.

32. (New) The device according to claim 31, comprising a temperature measurer to permanently measure temperature prevailing in the at least one cell culture within the at least one cell culture chamber and to input measured temperature as an actual temperature value into a suitable temperature control circuit, so that heating of the cell culture chamber can be suitably controlled.

33. (New) The device according to claim 32, wherein the at least one cell culture chamber includes a gas-permeable membrane so that a respective cell culture of a different type can be established on both sides of the membrane for the purpose of a direct co-culturing of the two cell cultures, wherein a control is to control a first media flow to one side of the membrane for a first cell culture and to control a second media flow different from the first media flow to a second side of the membrane.

34. (New) The device according to claim 33, comprising a computer-controlled monitoring and control system to receive data obtained by at least one of

- permanent microscopic observation of the at least one cell culture within the at least one cell culture chamber,

- permanent measuring of the relevant cell culture parameters, and

- permanent measuring of the temperature prevailing in the at least one cell culture within the at least one cell culture chamber, and

wherein a computer-controlled monitoring and control system is to process data and to transmit data for corresponding actuation of the feedback control.